

REMARKS

Entry of this amendment under 37 C.F.R. 1.116 is respectfully requested because it cancels a claim and complies with a matter of form requested by the Examiner, thereby placing the application in better form for appeal. No new matter is believed to be added to the application by this amendment.

Status of the Claims

Upon entry of this amendment, claims 1, 3-17, 19 and 21 are pending in the application. Claim 20 has been cancelled by this amendment. The amendments to claim 1 and 11 are supported by cancelled claim 20, and thus no new issues are presented by amended claims 1 and 11. Claims 3-5, 17, 19 and 21 have been amended to improve their language.

Claim Objections

Claims 3 and 4 are objected to as being dependent upon a cancelled claim. Claims 3 and 4, as amended, depend upon independent claim 1.

Rejection Under 35 U.S.C. §102(b) Over Kurematsu

Claims 1, 5, 7, 11-13 and 19-21 are rejected under 35 U.S.C. §102(b) as being anticipated by Kurematsu (U. S. Patent 5,816, 677). Applicant traverses.

The Present Invention and its Advantages

The present invention pertains to a novel back light unit for a liquid crystal display that has a cone pattern formed on an upper surface of the light guide plate. As a result, only one light-path converter and only one diffusion sheet are needed. Also, a reflection of the light-guide pattern and wall surface as well as the bright lines of the light input are minimized. In addition, different types of sheets can be used as the light-path converter to improve the light efficiency as well as to reduce the manufacturing cost.

As is typically embodied in instant claim 1, the invention sets forth:

1. A back light unit in a liquid crystal display including a lamp generating a light, and a light input having a lamp housing for housing the lamp and reflecting the light, said unit comprising:
 - a light-guide plate including a cone pattern to uniformly guide the light from the light input;
 - a light-path converter to control a progress direction of the light in such a manner that the light outputted from the light-guide plate is progressed in a direction perpendicular to a liquid crystal panel; and
 - a diffusion sheet for diffusing the light passing through the light-path converter into the liquid crystal panel, wherein the cone pattern is formed on an upper surface of the light-guide plate, and a density of cones increases as a distance from said lamp increases.

Distinctions of the Invention over Kurematsu

Kurematsu pertains to a back light device for a display apparatus. Figures 1, 2 and 14 of Kurematsu (relied upon by the Examiner) show a reflection means with a pattern of light reflecting (blocking) members 12 and light transmitting apertures 13 to distribute the light out of the light transmission plate 11. Kurematsu discusses that the reflecting members 12 or the apertures 13 may have various shapes, such as "circles, squares, rectangles, lozenges,

parallelograms, trapezoids and starts [sic].” See Kurematsu at column 4, lines 55-60.

Kurematsu fails to disclose or suggest cones.

At paragraph 2 of the Office Action, the Examiner asserts: “a **light guide plate S** including a transmission member 11 having a cone pattern . . . which would allow the light to be uniformly distributed out of the upper surface of the light-guide plate (col. 4, lines 55-60).” (Emphasis added). Kurematsu, however, clearly fails to disclose a light guide plate. The portion “S” relied upon by the Examiner is a space defined by the reflector, reflecting means and the transmission member. See, e.g., Kurematsu at column 5, lines 37, 42 and 67; column 6, line 53; column 8, line 65; column 10, lines 24, 37 and 59; column 12, lines 34 and 64.

The present invention, in contrast, uses one prism sheet and cone patterns (which Kurematsu fails to disclose) are formed on the light guide plate. Kurematsu, on the contrary, uses two prism sheets.

As a result, Kurematsu fails to either disclose or suggest an embodiment of the invention as is set forth in independent claims 1 and 11. Claims dependent upon independent claims 1 and 11 are patentable for at least the above reasons.

This rejection is accordingly overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Kurematsu In View of Rudisill

Claims 3 and 4 are rejected under 35 U.S.C. §103(a) as being obvious over Kurematsu in view of Rudisill (U. S. Patent 5,339,179). Applicant traverses.

Independent claim 1 has been amended to incorporate the subject matter of claim 20 (now cancelled). Claim 20 was free of this rejection over Kurematsu and Rudisill. Claims 3 and 4 depend upon independent claim 1 and are thus free of this rejection as well.

This rejection is accordingly overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Kurematsu In View of Ohara

Claims 6, 13 and 14 are rejected under 35 U.S.C. §103(a) as being obvious over Kurematsu in view of Ohara (U. S. Patent 5,844,720). Applicant traverses.

Independent claims 1 and 11 have been amended to incorporate the subject matter of claim 20 (now cancelled). Claim 20 was free of this rejection over Kurematsu and Ohara. Claims 6, 13 and 14 depend upon independent claim 1 or independent claim 11 and are thus free of this rejection as well.

This rejection is accordingly overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Kurematsu In View of Yokoyama

Claims 8, 13, 15 and 16 are rejected under 35 U.S.C. §103(a) as being obvious over Kurematsu in view of Yokoyama (U. S. Patent 5,899,552). Applicant traverses.

Independent claims 1 and 11 have been amended to incorporate the subject matter of claim 20 (now cancelled). Claim 20 was free of this rejection over Kurematsu and Yokoyama. Claims 8, 13, 15 and 16 depend upon independent claim 1 or independent claim 11 and are thus free of this rejection as well.

This rejection is accordingly overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Kurematsu In View of Yang

Claims 9, 10, 13 and 17 are rejected under 35 U.S.C. §103(a) as being obvious over Kurematsu in view of Yang (U. S. Patent 6,480,307 B1). Applicant traverses.

Yang is not prior art to the invention.

Yang was filed on June 30, 2000. The instant application claims priority of Korea P99-34361, which was filed on August 19, 1999. The priority document thus antedates Yang. A verified translation of the priority document was provided with the Amendment filed February 27, 2003.

Further, even if Yang were prior art to the invention, applicant notes that independent claims 1 and 11 have been amended to incorporate the subject matter of claim 20 (now cancelled). Claim 20 was free of this rejection over Kurematsu and Yang. Claims 9, 10, 13 and 17 depend upon independent claim 1 or independent claim 11 and are thus free of this rejection as well.

This rejection is accordingly overcome for two independent and distinct reasons, and withdrawal thereof is respectfully requested.

Information Disclosure Statement

Applicant thanks the Examiner for considering the information disclosure statement filed November 8, 2001, and for making the initialed PTO-1449 form of record in the application in the Office Action mailed November 29, 2002.

The Drawings

The Examiner is respectfully requested to indicate whether the drawing figures are acceptable in the next Official Action.

Conclusion

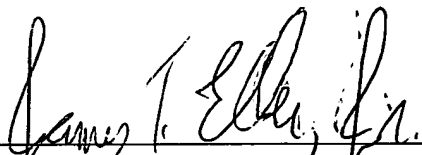
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of \$110.00 is attached hereto.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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